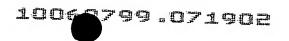


- 41. The polypeptide, as claimed in claim 39, having a sequence of at least 80% identity with the sequence shown in SEQ ID NO:1 from amino acid 37 to 1114.
- 42. The polypeptide, as claimed in claim 39, having a sequence of at least 90% identity with the sequence shown in SEQ ID NO:1 from amino acid 37 to 1114.
- 43. A polypeptide, as claimed in claim 39, having protease activity.

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- 44. A nucleic acid molecule comprising a sequence encoding a polypeptide having an amino acid sequence as set out in SEQ ID NO:1 from amino acid 37 to 1114, or a sequence having at least 50% identity thereto, or a functional fragment thereof.
- 45. A nucleic acid molecule comprising a sequence as set out in SEQ ID NO:2 or a sequence having at least 60% identity thereto, or a sequence which hybridises thereto under stringent conditions.
- 46. The nucleic acid molecule, as claimed in claim 45, comprising a sequence having at least 70% identity with the sequence shown in SEQ ID NO:2.
- 47. The nucleic acid molecule, as claimed in claim 45, comprising a sequence having at least 80% identity with the sequence shown in SEQ ID NO:2
- 48. The nucleic acid molecule, as claimed in claim 45, comprising a sequence having at least 90% identity with the sequence shown in SEQ ID NO:2.
- 49. A composition for use in raising an immune response in an animal comprising a polypeptide having an amino acid sequence as set out in SEQ ID NO:1 from amino acid 37 to 1114, or a sequence having at least 50% identity thereto, or a functional fragment thereof and optionally a carrier and/or adjuvant.
- 50. A composition for use in raising an immune response in an animal, comprising a nucleic acid sequence encoding a polypeptide having an amino acid sequence as set out in SEQ ID NO:1 from amino acid 37 to 1114, or a sequence having at least



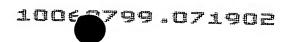
50% identity thereto, or a functional fragment thereof and optionally a carrier and/or adjuvant.

51. A polypeptide having an amino acid sequence as set out in SEQ ID NO:3 from amino acid 26 to 616, or a sequence having at least 50% identity thereto, or a functional fragment thereof.

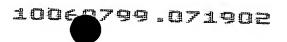
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- 52. The polypeptide, as claimed in claim 51, having a sequence of at least 70% identity with the sequence shown in SEQ ID NO:3 from amino acid 26 to 616.
- 53. The polypeptide, as claimed in claim 51, having a sequence of at least 80% identity with the sequence shown in SEQ ID NO:3 from amino acid 26 to 616.
- 54. The polypeptide, as claimed in claim 51, having a sequence of at least 90% identity with the sequence shown in SEQ ID NO:3 from amino acid 26 to 616.
- 55. The polypeptide, as claimed in claim 51, having lipase activity.
- A nucleic acid molecule comprising a sequence encoding a polypeptide having an amino acid sequence as set out in SEQ ID NO:3 from amino acid 26 to 616, or a sequence having at least 50% identity thereto, or a functional fragment thereof.
- 57. A nucleic acid molecule comprising a sequence as set out in SEQ ID NO:4 or a sequence having at least 60% identity thereto, or a sequence which hybridises thereto under stringent conditions.
- 58. The nucleic acid molecule, as claimed in claim 57, comprising a sequence having at least 70% identity with the sequence shown in SEQ ID NO:4.
- 59. The nucleic acid molecule, as claimed in claim 57, comprising a sequence having at least 80% identity with the sequence shown in SEQ ID NO:4.
- 60. The nucleic acid molecule, as claimed in claim 57, comprising a sequence having at least 90% identity with the sequence shown in SEQ ID NO:4.

- 61. A composition for use in raising an immune response in an animal, the composition comprising a polypeptide having an amino acid sequence as set out in SEQ ID NO:3 from amino acid 26 to 616, or a sequence having at least 50% identity thereto, or a functional fragment thereof and optionally a carrier and/or adjuvant.
- 62. A composition for use in raising an immune response in an animal, the composition comprising a nucleic acid sequence encoding a polypeptide having an amino acid sequence as set out in SEQ ID NO:3 from amino acid 26 to 616, or a sequence having at least 50% identity thereto, or a functional fragment thereof and optionally a carrier and/or adjuvant.
- 63. A polypeptide having an amino acid sequence as set out in SEQ ID NO:5, or a sequence having at least 60% identity thereto, or a functional fragment thereof.
- 64. The polypeptide, as claimed in claim 63, having a sequence of at least 70% identity with the sequence shown in SEQ ID NO:5.
- 65. The polypeptide, as claimed in claim 63, having a sequence of at least 90% identity with the sequence shown in SEQ ID NO:5.
- 66. The polypeptide, as claimed in claim 63, having haemolysin activity.
- 67. A nucleic acid molecule comprising a sequence encoding a polypeptide having an amino acid sequence as set out in SEQ ID NO:5, or a sequence having at least 60% identity thereto, or a functional fragment thereof.
- 68. A nucleic acid molecule comprising a sequence as set out in SEQ ID NO:6 or a sequence having at least 60% identity thereto, or a sequence which hybridises thereto under stringent conditions.
- 69. The nucleic acid molecule, as claimed in claim 68, comprising a sequence having at least 70% identity with the sequence shown in SEQ ID NO:6.



- 70. The nucleic acid molecule, as claimed in claim 68, comprising a sequence having at least 80% identity with the sequence shown in SEQ ID NO:6.
- 71. The nucleic acid molecule, as claimed in claim 68, comprising a sequence having at least 90% identity with the sequence shown in SEQ ID NO:6.
- A composition for use in raising an immune response in an animal, the composition comprising a polypeptide having an amino acid sequence as set out in SEQ ID NO:5, or a sequence having at least 60% identity thereto, or a functional fragment thereof and optionally a carrier and/or adjuvant.
- 73. A composition for use in raising an immune response in an animal, the composition comprising a nucleic acid sequence encoding a polypeptide having an amino acid sequence as set out in SEQ ID NO:5, or a sequence having at least 60% identity thereto, or a functional fragment thereof and optionally a carrier and/or adjuvant.
- 74. A composition for use in raising an immune response in an animal directed against *Moraxella*, the composition comprising at least one polypeptide selected from the group consisting of polypeptide as given in SEQ ID NO:1 from amino acid 37 to 1114, SEQ ID NO:3 from amino acid 26 to 616, and SEQ ID NO:5.
- 75. The composition of claim 74 wherein said peptide having at least 50% identity to the peptide selected from the group consisting of a peptide as given in SEQ ID NO:1 from amino acid 37 to 1114, SEQ ID NO:3 from amino acid 26 to 616, and SEQ ID NO:5.
- 76. The composition, as claimed in claim 74, the composition comprising a polypeptide having at least 60% identity to the amino acid sequence as given in SEQ ID NO:5 or a functional fragment thereof, and either one of, or preferably both of, a polypeptide having at least 50% identity to the amino acid sequence as given in SEQ ID NO:1 or a functional fragment thereof and a polypeptide having at least 50% identity to the amino acid sequence as given in SEQ ID NO:3 or a functional fragment thereof.



- 77. The composition, as claimed in claim 74, wherein the *Moraxella* is *M. bovis* or *M. catarrhalis*.
- 78. The composition, as claimed in claim 75, wherein the *Moraxella* is *M. bovis* or *M. catarrhalis*.
- 79. The composition, as claimed in claim 76, wherein the *Moraxella* is *M. bovis* or *M. catarrhalis*.
- 80. The composition, as claimed in claim 74, wherein the *Moraxella* is *M. bovis*.
- 81. The composition, as claimed in claim 75, wherein the *Moraxella* is *M. bovis*.
- 82. The composition, as claimed in claim 76, wherein the Moraxella is M. bovis.
- 83. An antibody raised against a polypeptide selected from the group consisting of a polypeptide as given in SEQ ID NO:1 from amino acid 37 to 1114 or a functional fragment thereof, SEQ ID NO:3 from amino acid 26 to 616 or a functional fragment thereof, and SEQ ID NO:5 or a functional fragment thereof.
- 84. The antibody of claim 83 wherein said polypeptide has at least 50% identity to the polypeptide as given in SEQ ID NO:1 from amino acid 37 to 1114 or a functional fragment thereof, SEQ ID NO:3 from amino acid 26 to 616 or a functional fragment thereof, and SEQ ID NO:5 or a functional fragment thereof.